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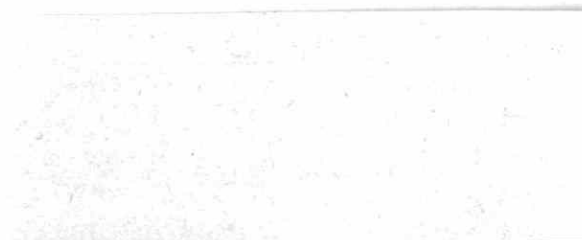
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AN EVALUATION OF THE PROBLEMS OF PARTICULATE EMISSIONS FROM THE WOOD PRODUCTS INDUSTRY

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EXTENDED ABSTRACT

Introduction

An evaluation of problems of particulate emission in the wood products industry was conducted on behalf of the Ontario Ministry of the Environment. The objectives of the evaluation were as follows:

- (a) to identify the problems and sources of particulate emission in the wood products industry;
- (b) to determine how the industry and other regulatory agencies treat these problems;
- (c) to provide conclusions and recommendations concerning the resolution of the problems;
- (d) to provide a basis for good approval as well as management and operations guidelines for wood storage sites and other sources of fugitive wood particulate emissions;
- (e) to provide a basis for improved monitoring of wood particulate to assist in the regulatory process;
- (f) to recommend further research that might help to resolve the problems.

Methodology

The objectives were achieved using literature surveys, telephone interviews and field trips. The literature surveys were conducted by means of the CAN/OLE and DIALOG literature data base enquiry systems and the RWDI in-house technical library. Sixty articles pertaining to health effects, monitoring, regulation and control of wood dust were reviewed.

Through the telephone interviews, seventeen North American government

agencies, thirteen wood products facilities, three special interest groups and eleven dust control manufacturers or consultants were contacted. Two field trips were conducted. The first trip was to Hearst, Ontario where four wood products sites were visited. The second trip was to Oregon, U.S.A., where four pulp mills, four particleboard facilities and several sawmills were visited.

Findings

The findings of the evaluation included the following items.

- (i) The health effects and other problems associated with wood dust emissions were reviewed. Wood dust has been identified in the literature as a cause of nasal and lung cancers, asthma and other respiratory diseases, and inflammation of the skin, eyes and nasal passage. Higher than normal incidence of these ailments have been observed among woodworkers. The incidence among residents living near wood products facilities has not been investigated. Nevertheless, these residents are known to be exposed to wood dust and it is often considered a significant nuisance.
- (ii) The principal sources of wood dust emissions were identified. Wood

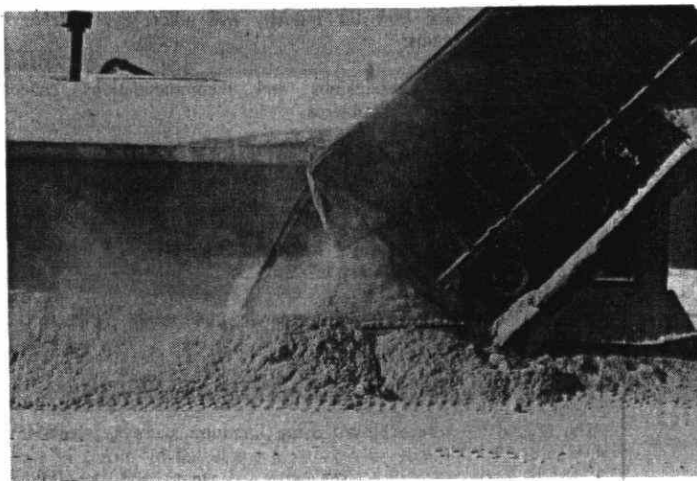


Figure 1 Wood dust emissions at an outdoor truck dump

dust is an inevitable by-product of the manufacture of wood products. The greatest potential for emissions often occurs at particleboard and hardboard plants, where the raw material used in production (wood shavings and trimmings) has a high dust content and is usually stored in abundance. The principal causes of dust emissions are: continuous dropping of material at stackers, blowpipes and other transfer points; batch dropping by front-end loaders and truck dumping (Figure 1); wind erosion of outdoor stockpiles; exhaust emissions from pneumatic material transfer systems and air handling equipment (e.g. cyclones); vehicle activity on dusty surfaces.

- (iii) Existing dust control technologies used in the wood products industry were reviewed. Examples of stockpile windbreaks and enclosures (Figure 2), chutes on blowpipes, ventilated truck dump enclosures



Figure 2 Enclosed wood shavings pile (right) and ventilated truck dump enclosure (centre)

and water mist systems were presented.

- (iv) Particulate monitoring, approvals and permitting practices among various government agencies were reviewed.

- (v) Improved particulate monitoring techniques were reviewed. These included methods of correlating particulate measurements with wind and other meteorological data, as well as improved designs for dustfall collectors.

Recommendations

The recommendations of the evaluation may be summarized as follows:

1. The approval process in Ontario should include requirements for regular reporting of dust control equipment maintenance and compliance with emission standards for fugitive particulate sources (such as blowpipes, stackers, wind erosion of stockpiles, truck loading and unloading and vehicle traffic).
2. There are several fundamental dust control practices that should be implemented at all facilities, in order to help meet both ambient air quality and emission standards. These include indoor storage of sander dust and dry sawdust, enclosure of stackers and blowpipes at outdoor storage piles, use of enclosures or windbreaks at truck dumps and cleaning of roadways. Additional controls should be implemented as determined from dispersion modelling studies. These additional controls might consist of strategically located porous windbreaks, streamlined stockpile designs, strategic stockpile management and reduction of operations during windy conditions.
3. Particulate monitoring data should be correlated with wind data to identify the primary particulate emission sources in a multisource region.
4. Further research is recommended to develop better fugitive source emission factors for the wood products industry and to develop a dustfall collector with better collection efficiency.



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